Int J Public Health (2014) 59:309–317
DOI 10.1007/s00038-013-0531-9

SSPH+ SWISS SCHOOL OF PUBLIC HEALTH +

ORIGINAL ARTICLE

Explaining educational inequalities in adolescent life satisfaction: do health behaviour and gender matter?

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Received: 2 May 2013 / Revised: 12 November 2013 / Accepted: 27 November 2013 / Published online: 25 December 2013

Abstract
Objectives There is little evidence on the explanation of health inequalities based on a gender sensitive perspective. The aim was to investigate to what extent health behaviours mediate the association between educational inequalities and life satisfaction of boys and girls.
Methods Data were derived from the German part of the Health Behaviour in School-aged Children (HBSC) study 2010 ($n = 5{,}005$). Logistic regression models were conducted to investigate educational inequalities in life satisfaction among 11- to 15-year-old students and the relative impact of health behaviour in explaining these inequalities.
Results Educational inequalities in life satisfaction were more pronounced in boys than in girls from lower educational tracks (OR 2.82, 95 % CI 1.97–4.05 and OR 2.30, 95 % CI 1.68–3.14). For adolescents belonging to the lowest educational track, behavioural factors contributed to 18 % (boys) and 39 % (girls) in the explanation of educational inequalities in life satisfaction.
Conclusions The relationship between educational track and life satisfaction is substantially mediated by health-related behaviours. To tackle inequalities in adolescent health, behavioural factors should be targeted at adolescents from lower educational tracks, with special focus on gender differences.

Keywords Health behaviour · HBSC · Adolescent health · Social inequality · Gender

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Introduction

It is well established that health is significantly linked to people's social position (Mackenbach et al. 2008). Besides socioeconomic factors, gender substantially affects individual's health and its conditions, leading to the demand that research should be more sensitive for differences deriving from gender (Sen et al. 2007; WHO 2011). In particular, there are gender differences in the extent as well as in the dimensions of health inequalities (Matthews et al. 1999). It is assumed that the unequal distribution of risk factors and resources as well as the different health impact of these factors depending on gender-specific socialization (such as body awareness or coping strategies) is of high relevance (Bartley 2004; Denton et al. 2004). In general, the social gradient in health is more pronounced in men than in women, but these gender differences vary by age, health outcome and measure of socioeconomic position (Matthews et al. 1999). Previous studies focusing on gender differences in health inequalities are almost exclusively limited to adulthood, although a growing number of studies indicate the existence of inequalities in health and health

behaviour already in childhood and adolescence (Koivusilta et al. 2006), showing consistent social inequalities in self-rated health over the last decade among German adolescents (Moor et al. 2012). Gender differences in self-rated health and well-being in adolescents increase with age and these inequalities in (subjective) health tend to be more pronounced among girls (Currie et al. 2012; Ravens-Sieberer et al. 2007; Torsheim et al. 2006).

So far, it has rarely been investigated, why gender differences in health inequalities exist (Bartley 2004). One important explanatory mechanism might be health behaviour which is one of the main causes of health inequality (Schreier and Chen 2010; Stronks et al. 1996) as it is associated with health and social position (Torsheim et al. 2007) and differs between both genders. Social inequalities in health behaviour most likely have their origin early in life, deriving from socialization and the living conditions in childhood and adolescence (van Lenthe et al. 2009). Several studies showed that behavioural factors such as smoking, physical activity, fruit and vegetable intake, or illegal drug use are socially patterned already in adolescence (Currie et al. 2012; Hagquist 2007; Hanson and Chen 2007). Studies among adults indicate that about 30 % of educational inequalities in self-rated health could be explained by behavioural factors (such as smoking, diet, and physical activity) (Thrane 2006), and even 30–50 % in socioeconomic differences in mortality (Laaksonen et al. 2008). Less evidence is found for adolescence, since only few studies quantify the relative importance of health behaviour for explaining health disparities in this early life period. Available studies assume an important role for health behaviours in adolescence (Richter et al. 2009, 2012; Torsheim et al. 2007), but none of them investigated the relative impact of behavioural factors to explain health inequalities in adolescence using a gender-differentiated perspective (Pitel et al. 2010).

Understanding the underlying mechanisms between social position and health in adolescence is a precondition to develop effective strategies that help to place social disadvantaged adolescents on a healthier trajectory into adulthood (Schreier and Chen 2010). Life satisfaction covers a multifactorial psychological concept of well-being measuring the cognitive evaluation of the overall life circumstances based on own criteria (Pavot and Diener 1993). So far, life satisfaction was rather neglected in public health research. International results revealed that life satisfaction is unequally distributed among different socioeconomic groups, indicating higher life satisfaction for adolescents from families with higher social position compared to those with lower social positions. These socially determined inequalities appear in nearly all countries in Europe and North America in boys and girls and are stronger than for other subjective health indicators in adolescence (Currie et al. 2012; Levin et al. 2011). Further, inequalities in life satisfaction seem to be more pronounced in girls. The present study is among the first focusing on the role of health behaviour for explaining social inequalities in adolescent life satisfaction among girls and boys. As adolescents have not yet achieved a socioeconomic position, the social position of the parents is usually used (e.g. parental level of education, parental occupational status, or family household income). Recent studies, however, have used new indicators based on information on young people's (future) social position such as adolescents' educational aspirations or current educational level as well as their own perceived social position. These indicators seem to have a strong or even stronger relationship to health and health behaviour than the adolescents' parental socioeconomic background (Hagquist 2007; Koivusilta et al. 2006; Kuntz and Lampert 2013).

The aim of the study was to investigate the role of health behaviour in explaining educational inequalities in life satisfaction among adolescents. We examine (1) whether significant differences in life satisfaction by educational track among girls and boys exist, (2) whether there are gender differences regarding the impact of behavioural factors on life satisfaction (3) as well as whether health behaviours are unequally distributed among different educational tracks, and (4) to what extent educational inequalities in life satisfaction could be explained by behavioural factors.

Methods

Data were obtained from the German part of the international "Health Behaviour in School-aged Children (HBSC)" study, a multinational cross-sectional survey conducted in collaboration with the World Health Organization. The aim of the HBSC study was to describe young people's health and health behaviour and to analyse how these outcomes are related to the social context. Cross-sectional surveys are carried out every 4 years in a growing number of countries based on an internationally agreed protocol (Currie et al. 2008). Starting in 1983 with 4 countries, the latest survey in 2010 included a total of 41 countries in Europe, North America, and Israel. A detailed description of the aims and theoretical framework of the study can be found elsewhere (Currie et al. 2012).

Sample

The German HBSC study 2010 is based on a representative sample of 15 out of 16 federal states. Students were selected using a clustered sampling design. The fieldwork took place between January and July 2010. Schools were

sampled randomly from a list of public schools, stratified by type of school and administrative district. The response rate on school level was 48 %, and the individual response rate was 86 % for students formally enrolled in participating schools. As in Germany students are taught in age-homogeneous classes, pupils from grades 5, 7, and 9 were included, representing the age groups of 11-, 13-, and 15-year-olds. Data were collected by means of a standardized questionnaire. Those students were included in the study who had volunteered to participate and whose parents had also signed an informed consent. The study was approved by the federal data protection commissioner of each federal state. The current analyses are based on a sub-sample due to different school systems in the federal states of Germany. Only those federal states with a comparable school system were selected: Bavaria, Hesse, Lower Saxony, North Rhine-Westphalia, and Schleswig–Holstein. The analyses are based on a total of 3,648 students, representing 73 % of the original sample ($n = 5{,}005$).

Instrument and variables

Life satisfaction

Life satisfaction was measured by the Cantril Ladder (Cantril 1966). The students were asked to indicate on a picture of a ladder with 10 steps which position applies best regarding their life at the moment (10 = best possible life to 0 = worst possible life). The scale was dichotomised in "high life satisfaction" (6 or higher) and "low life satisfaction" (lower than 6) (Levin et al. 2011).

Educational track

Educational track has been included in the analyses as an indicator of students' own social position. The German educational system is well known for its "tripartite" structure, indicating a co-existence of different tracks in secondary education, and its high social segregation among different tracks (i.e. the transition to a secondary track is associated to the social background of students). Thus, there is considerable variation across the German federal states regarding the number and quality of these tracks. For our analyses, we included five federal states with a comparable school system, which have three educational tracks at secondary school level. The most basic type is secondary general school (low educational track, "Hauptschule"), followed by the relatively more advanced intermediate school (medium educational track, "Realschule"), and the most advanced grammar school (high educational track, "Gymnasium") with a final examination that qualifies for university entrance. Besides the three tracks, a fourth school type exists which does not fit completely into the hierarchically structured system. This comprehensive school (mixed track) unites students of all levels of ability under one roof and offers options for all three "tracks" above. For this mixed type, it is hard to match a social position, and therefore students from this school will not be considered in the analyses.

Behavioural factors

A wide range of behavioural factors was selected covering the most important dimensions of adolescent health-related behaviour. Behavioural factors were measured by information about smoking (at least once a week versus less than once a week/never), alcohol consumption (at least every week versus less than every week) and been drunk (never or once versus more than once). Physical activity was assessed with a 60-min moderate to vigorous physical activity (MPVA) screening measure (Prochaska et al. 2001) (physically active for at least 60 min on at least 5 days versus fewer days) as well as TV consumption (<2 h versus at least 2 h daily). We also included items on the consumption of fruits, vegetables, sweets, and soft drinks (daily versus less than daily) as well as eating breakfast on school days (every school day versus less than every school day).

Statistical analyses

To estimate educational differences in the prevalence of low life satisfaction, we fitted separate logistic regression models for girls and boys, adjusted for age. Odds ratios for educational track with 95 % confidence intervals were calculated. The highest educational track served as reference category. For all analyses, cases with missing values on life satisfaction, educational track, age, and gender were excluded ($n = 183$); for the behavioural variables, a missing category was included. We first analysed the association between educational track and each behavioural factor as well as between the latter and life satisfaction. Those behavioural factors with a significant effect for life satisfaction and a negative association with educational level were selected for explanatory analyses. Regarding gender differences in the analyses, a separate selection of the variables by gender was done, so that different behavioural factors were included for boys and girls. For our reference model, we analysed odds ratio for life satisfaction by educational track, adjusted for age only (model 1). In the next step, we added gender-specific behavioural factors separately (model 2) as well as one block (model 3) in addition to model 1. The percentage reduction of the OR due to adjustment of behavioural factors was then calculated: $(OR_{(model\ 1)} - OR_{(model\ 2–3)}/$

$(OR_{(model\ 1)} - 1)) \times 100$ (Richter et al. 2012; Skalicka et al. 2009; Stronks et al. 1996). We used SPSS 18.0 for all analyses.

Results

Educational inequalities in life satisfaction

Table 1 presents the study population by age, educational track and life satisfaction for girls and boys. The largest group consists of students in the highest educational track (42.8 %), followed by medium educational track (28.6 %) and low educational track (19 %). There are significant gender differences in life satisfaction, with girls reporting higher level of low life satisfaction (18.3 %) than boys (12.9 %).

Further, significant inequalities in life satisfaction by educational track were found for both genders. The higher the educational track, the lower is the prevalence of low life satisfaction (Table 2). For boys the comparison between low versus high educational track showed a higher odds ratio (OR 2.82) than for girls (OR 2.30) for low life satisfaction.

Table 1 Characteristics of the study population ($n = 3{,}648$), German HBSC study 2010

	Total ($n = 3{,}648$)		Boys ($n = 1{,}788$)		Girls ($n = 1{,}860$)	
	n	%	*n*	%	*n*	%
Age (years)*	3,648					
11	1,179	32.3	610	34.1	569	30.6
13	1,209	33.1	599	33.5	610	32.8
15	1,260	34.5	579	32.4	681	36.6
Educational track	3,648					
High educational track	1,561	42.8	747	41.8	814	43.8
Mixed educational track[a]	349	9.6	163	9.1	186	10.0
Medium educational track	1,045	28.6	518	29.0	527	28.3
Low educational track	693	19.0	360	20.1	333	17.9
Life satisfaction*	3,648					
Average/high	3,078	84.4	1,558	87.1	1,520	81.7
Low	570	15.6	230	12.9	340	18.3

* $p < 0.05$

[a] Not considered for further analyses

Association between health behaviour and life satisfaction as well as health behaviour and educational track

In Table 3, the relationship between different health behaviours and life satisfaction as well as between educational track and health behaviour is presented. Logistic regression models identified several behavioural factors to be associated with low life satisfaction in boys and girls such as having breakfast less than daily and drinking soft drinks daily. However, there are gender differences in the effect of behavioural factors on life satisfaction. Boys who did not have breakfast every school day had an OR of 1.58 for low life satisfaction; in girls the association was much stronger with OR 2.47. Other behavioural factors such as regular smoking (OR 2.45), drinking alcohol (OR 2.19), been drunk (OR 1.56), TV consumption (OR 1.29) and eating fruits daily (OR 1.32) were associated with lower life satisfaction in girls, but not in boys. In contrast, lower physical activity (OR 2.13) was stronger related to lower life satisfaction in boys.

Based on bivariate analyses, the distribution of behavioural factors among boys and girls from different educational tracks were examined. We found higher prevalence of regular smoking, being drunk, TV consumption as well as higher rates of breakfast consumption less than daily and daily soft drink intake among boys and girls from lower educational tracks. However, regular

Table 2 Odds ratios (OR) and 95 % confidence intervals (95 % CI) of low life satisfaction by educational track for boys and girls aged 11–15 years ($n = 3{,}648$), German HBSC study 2010

	Boys ($n = 1{,}788$)				Girls ($n = 1{,}860$)			
	OR	95 % CI	Low life satisfaction		OR	95 % CI	Low life satisfaction	
			n	%			*n*	%
Educational track								
High educational track (ref.)	1.00		63	8.4	1.00		113	13.9
Medium educational track	1.79*	1.26–2.55	73	14.1	1.56*	1.17–2.09	105	19.9
Low educational track	2.82*	1.97–4.05	74	20.6	2.30*	1.68–3.14	90	27.0

Separate logistic regression models, adjusted for age

ref. reference

* $p < 0.05$

Table 3 Odds ratios (OR) and 95 % confidence intervals (95 % CI) for low life satisfaction and prevalence rates by educational track for behavioural factors ($n = 3{,}648$), German HBSC study 2010

	Boys ($n = 1{,}788$)						Girls ($n = 1{,}860$)					
	Low life satisfaction		Educational track				Low life satisfaction		Educational track			
	OR	95 % CI	High	Medium	Low	*p* value	OR	95 % CI	High	Medium	Low	*p* value
Behavioural factors												
Smoking												
Infrequent/non-smoking (ref.)	1.00		97.2	93.3	86.9	0.000	1.00		97.6	92.1	84.7	0.000
Regular	1.68	0.98–2.88	2.4	6.7	12.0		2.45*	1.61–3.74	2.2	7.3	15.0	
Alcohol consumption												
Less than every week (ref.)	1.00		89.1	85.8	84.1	0.103	1.00		93.0	91.8	89.3	0.004
Daily or at least every week	1.04	0.64–1.68	9.3	13.0	14.8		2.19*	1.41–3.42	5.0	7.5	9.3	
Been drunk												
Never or once (ref.)	1.00		88.5	85.2	77.9	0.000	1.00		89.3	86.2	83.8	0.010
More than once	1.06	0.67–1.68	10.7	13.5	21.5		1.56*	1.08–2.26	10.4	12.3	15.9	
Physical activity												
On 6 or 7 days (ref.)	1.00		32.6	26.1	32.4	0.012	1.00		21.5	21.5	21.8	0.833
<6 days	2.13*	1.50–3.02	65.8	70.7	63.2		1.37*	1.01–1.87	77.3	76.8	75.9	
TV consumption (school days)												
<2 h (ref.)	1.00		49.7	35.4	34.2	0.000	1.00		51.9	40.0	32.1	0.000
At least 2 h	1.15	0.86–1.54	48.6	62.3	62.8		1.29*	1.01–1.64	47.1	59.1	66.8	
Breakfast consumption												
Daily (ref.)	1.00		74.4	64.1	49.7	0.000	1.00		71.0	57.9	49.4	0.000
Less than daily	1.58*	1.18–2.10	25.0	34.8	48.4		2.47*	1.94–3.14	28.7	41.7	47.9	
Fruits consumption												
Daily (ref.)	1.00		30.0	26.2	29.0	0.380	1.00		49.6	36.8	38.6	0.000
Less than daily	0.99	0.73–1.34	69.7	73.6	70.5		1.32*	1.03–1.68	50.2	63.0	60.6	
Vegetable consumption												
Daily (ref.)	1.00		19.4	17.7	18.3	0.866	1.00		35.0	30.5	29.0	0.190
Less than daily	1.42	0.97–2.10	80.0	81.9	80.9		1.30	1.00–1.68	65.0	69.2	70.7	
Sweets consumption												
Less than daily (ref.)	1.00		75.5	79.1	74.7	0.539	1.00		67.2	70.8	74.4	0.024
Daily	0.90	0.65–1.26	23.9	20.7	24.5		1.08	0.84–1.40	32.8	28.8	25.0	
Soft drinks consumption												
Less than daily (ref.)	1.00		83.6	74.0	64.6	0.000	1.00		89.1	79.8	73.2	0.000
Daily	1.49*	1.10–2.03	16.0	25.7	35.1		1.38*	1.03–1.86	10.8	19.8	26.2	

Separate logistic regression models for boys and girls, adjusted for age

ref. reference

* $p < 0.05$

alcohol drinking, consumption of fruits (less than daily) and daily sweets were associated with low educational track only in girls and physical activity only in boys. In total, from ten behavioural factors, three indicators for boys (physical activity, breakfast, soft drinks consumption) and seven for girls (smoking, drinking alcohol, been drunk, TV consumption, breakfast, fruits, and soft drinks consumption) were significantly linked to life satisfaction as well as to educational track, and were therefore included in the multivariate analyses.

Role of health behaviour for explaining educational inequalities

In order to examine the relative contribution of behavioural factors for the explanation of educational inequalities in adolescent life satisfaction, behavioural factors were first added separately (model 2) and then simultaneously (model 3) to the reference model (model 1), adjusting for age only (Table 4). Compared to model 1, the OR for low life satisfaction decreased after adjusting for health

Table 4 Odds ratios (OR) and 95 % confidence (95 % CI) intervals of low life satisfaction by educational track, crude and adjusted for behavioural explanatory factors among 11- to 15-year-olds ($n = 3{,}648$), German HBSC study 2010

	Educational track				
	High	Medium		Low	
	OR (95 % CI)	OR (95 % CI)	Percentage (%)	OR (95 % CI)	Percentage (%)
Boys ($n = 1{,}788$)					
Model 1	1.00	1.79* (1.26–2.55)		2.82* (1.97–4.05)	
Model 2 (+physical activity)		1.71* (1.20–2.45)	10	2.83* (1.97–4.08)	−1
Model 2 (+breakfast)		1.73* (1.21–2.47)	8	2.61* (1.80–3.77)	12
Model 2 (+soft drinks)		1.75* (1.22–2.50)	5	2.69* (1.87–3.89)	7
Model 3 [+all behavioural factors (physical activity, breakfast, soft drinks)]		1.61* (1.12–2.31)	23	2.49* (1.71–3.63)	18
Girls ($n = 1{,}860$)					
Model 1	1.00	1.56* (1.17–2.09)		2.30* (1.68–3.14)	
Model 2 (+smoking)		1.50* (1.12–2.02)	11	2.09* (1.52–2.87)	16
Model 2 (+alcohol)		1.54* (1.15–2.06)	4	2.23* (1.63–3.05)	5
Model 2 (+been drunk)		1.55* (1.16–2.08)	2	2.25* (1.65–3.07)	4
Model 2 (+TV consumption)		1.54* (1.15–2.06)	2	2.23* (1.63–3.06)	2
Model 2 (+breakfast)		1.40* (1.04–1.88)	27	1.97* (1.43–2.71)	22
Model 2 (+fruits)		1.52* (1.14–2.04)	5	2.24* (1.64–3.06)	1
Model 2 (+soft drinks)		1.53* (1.14–2.05)	5	2.21* (1.61–3.03)	7
Model 3 [+all behavioural factors (smoking, alcohol, been drunk, TV consumption, breakfast, fruits, soft drinks)]		1.37 (0.99–1.81)	34	1.79* (1.29–2.50)	39

Separate and joint logistic regression models for boys and girls, adjusted for age

* $p < 0.05$

behaviours in both genders. The attenuation was much higher for girls than for boys.

Single behavioural factors (except physical activity in low educational track) reduced the OR for low life satisfaction for 5–12 % in boys. Taking all behaviours into account, the OR for low life satisfaction in boys was reduced from 1.79 to 1.61 (medium educational track) and from OR 2.82 to 2.49 (low educational track), indicating a 23 % and 18 % attenuation by behavioural factors. In girls, breakfast consumption on every school day accounted most for the relationship and reduced the OR for low satisfaction up to 27 %, followed by smoking with 11–16 %. The other behavioural factors had a modest explanatory power (model 2). Altogether, behavioural factors could reduce the OR for girls with medium educational track from 1.56 to 1.37 (34 %) and from 2.30 to 1.79 (39 %) with low educational track (model 3). Thus, up to 40 % of educational inequalities in life satisfaction in girls were explained by behavioural determinants which is nearly twice than it is for boys.

Discussion

Our study is among the first to analyse the mediating role of behavioural factors for explaining educational inequalities in life satisfaction in boys and girls so far. We identified a clear social gradient among 11- to 15-year-old German adolescents with higher educational inequalities for boys than girls. Second, we found that several health behaviours are significantly related to educational track; some behaviours are significantly associated with educational track among boys, while other behaviours were only significant among girls. Furthermore, certain unhealthy behaviours are already in adolescence linked to low life satisfaction and differ partly by gender. For girls, health behaviour contributed almost twice as much to educational inequalities in life satisfaction than for boys, after taking all behavioural factors into account.

Comparison with previous research

These findings are consistent with other studies showing socioeconomic differences in adolescent health and life satisfaction (Currie et al. 2012; Ravens-Sieberer et al. 2007; Starfield et al. 2002). Our results identified stronger educational inequalities in life satisfaction among boys, whereas other studies indicate higher inequalities in life satisfaction in girls than in boys (Levin et al. 2011; Ravens-Sieberer et al. 2007). The recent international HBSC data

showed that girls with low family affluence seem to be more disadvantaged in life satisfaction in nearly all European countries (Currie et al. 2012). These results can also be found for psychosomatic complaints (Torsheim et al. 2006) and for self-rated health (Currie et al. 2012).

Our study supports other findings on the relationship between life satisfaction and physical activity and sedentary behaviour in Canada and the USA (Iannotti et al. 2009), as well as between life satisfaction and binge drinking in Wales (Desousa et al. 2008) or between substance use in the Netherlands (van Kooten et al. 2007). Furthermore, our findings confirm results from previous studies showing that low social position is associated with increased risk behaviour among boys and girls (Currie et al. 2012; Hagquist 2007; Hanson and Chen 2007; Richter and Leppin 2007).

Regarding the role of health behaviour for explaining health inequalities, studies focusing on adulthood showed that behavioural factors mediate the relationship between social position and health substantially (Laaksonen et al. 2008; Thrane 2006). Compared to adulthood, only few studies investigated the determinants and pathways that explain social inequalities in young people's health, especially in life satisfaction. The present study highlights a large explanatory power of health behaviour in educational disparities in adolescent life satisfaction. In an international study of 33 European and North American countries, similar results were observed for boys (24 %) regarding inequalities in self-rated health by family affluence. For girls the contribution was lower (23 %) than in our study (Richter et al. 2009). From all behavioural factors considered, breakfast consumption for both genders and smoking for girls had the largest contribution for adolescents from the lowest educational track; physical activity was also relevant for boys with medium educational track. Similar results were found by Torsheim et al. (2007), who investigated the mediating role of behavioural factors for socioeconomic differences in adolescent self-rated health with smoking, physical activity and fruit and vegetable intake to be of special importance.

Interpretation

The identified gender differences in the explanatory power of behavioural factors may result from two different mechanisms (Denton et al. 2004; Madarasova Geckova et al. 2003; Pitel et al. 2010). First, inequalities could arise from different exposures (unequal distribution of health determinants). We found more behavioural factors to be unequally distributed in girls than in boys which underline this hypothesis. Second different effects of health behaviour on life satisfaction were observed, indicating an unequal vulnerability between both genders (different health impact of these determinants). It seems that some behavioural factors have an impact (or higher impact) on life satisfaction in girls (e.g. smoking, alcohol consumption, TV consumption, or breakfast consumption) which is not (or not that much) visible for boys. In total, other and rather more behavioural factors had an effect for girls that could lead to a different and higher explanatory contribution compared to boys. Denton et al. (2004) investigated the role of explanatory factors in explaining gender-specific health inequalities in adult health and found support for both hypotheses, an unequal distribution and different impact for women and men.

However, a large part of inequalities still remains unexplained, suggesting a complex structure of mechanisms leading to health inequalities. Although health behaviours play an important role in illuminating social inequalities in health, health behaviour is also shaped by the material/structural and psychosocial circumstances in which adolescents live (Richter et al. 2012).

Methodological considerations

One of the strengths of the study is the large national data set which allowed analyses for girls and boys separately. Further, we included multiple health behaviours relevant for adolescent health and life satisfaction. However, with its cross-sectional design, the HBSC study is limited to establish causal relationships. In our study, we assumed that behavioural factors mediate the relationship between educational track and life satisfaction. The associations between behavioural variables and life satisfaction may well be operating inversely: For instance, low life satisfaction could lead to higher substance use to compensate for dissatisfaction with one's life (Topolski et al. 2001). In addition, the relationship between health behaviour and social position could also be reverse. In a Finnish follow-up study, Koivusilta et al. (2003) observed that health-related selection via indirect selection (based on health behaviour), rather than direct (based on health), contributes partly to the explanation of educational differences in adult health. However, the impact of school achievement and socio-demographic background on attained educational track was more important than health behaviour. In addition, it should be considered, that health behaviour like substance use has its onset in adolescence, where the decision of educational track is already made (Elstad 2010; Kuntz and Lampert 2013).

Further, measuring social position in adolescence is always a challenge, as young people do not have an own socioeconomic position yet (Currie et al. 2008). Parental social position such as their education, occupational class, or income is often used to operationalise the social position of adolescents. We decided to use the educational track of adolescents as a proxy for adolescents' (future)

socioeconomic position. This indicator has been increasingly used in research to investigate social inequalities in adolescence (Berten et al. 2012; Hagquist 2007; Havas et al. 2010; Koivusilta et al. 2006). For future research, we recommend replicating our analysis using different indicators of social position in adolescence.

Of course, the results on the relative importance of behavioural factors depend on the variables included in the analysis. Although we selected numerous key variables of health-related behaviour in adolescence, the inclusion of other variables would maybe yield different estimates of the contribution. We do not expect great differences as we already included a wide range of significant behavioural factors in adolescent life. Nevertheless, the contribution of health behaviour should be seen as an appropriate measure for the importance of these factors rather than absolute 'parameters' (van Oort et al. 2005).

Conclusion

There is a lack of studies investigating the relationship between gender and health inequalities, especially in adolescence. This study adds new insights in the role of health behaviour for inequalities in life satisfaction among adolescents from different educational tracks. Our results show that educational inequalities in life satisfaction already exist in this early stage of life. The findings indicate that behavioural factors are important mediating factors for educational inequalities in adolescent life satisfaction among both genders, but to a much greater extent among girls. Against the background of the results, a gender-specific perspective on health and health inequalities appears to be inevitable. Thus, strategies for tackling inequalities in adolescent health should be directed on health behaviour in regard of a gender-differentiated consideration. Understanding the underlying factors in early lifespan can improve young people's health and reduce health inequalities across the life course (Schreier and Chen 2010). Our results could therefore provide the basis to develop interventions to reduce gender-specific health inequalities among adolescents.

Acknowledgments The "Health Behaviour in School-aged Children (HBSC)" study is an international survey conducted in collaboration with the WHO Regional Office for Europe. The current International Coordinator is Professor Candace Currie, CAHRU, University of St Andrews and the Data Bank Manager is Dr Oddrun Samdal, University of Bergen.

Conflict of interest None declared.

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